

EXHIBIT A

I. Introduction

The California Energy Commission, hereafter referred to as Energy Commission, is directed by Public Resources Code Section 25301 to prepare a forecast of transportation fuel demand. The Fossil Fuels Office in the Fuels and Transportation Division prepares the forecast and assessment of transportation fuel demand, the outlook for retail fuel prices, and the analysis of shifts in fuel types, vehicle types, and other factors based on data gathered and analyzed from various sources.

The Energy Commission conducts a California Vehicle Survey (CVS) periodically to update California household and commercial sectors' changes in preferences for light duty vehicles (LDV). Fuel demand, however, is determined by vehicle stock and fuel economy, as well as travel behavior. The Energy Commission utilizes separately developed travel demand models, but relies on the California Household Travel Survey (CHTS) and other sources to obtain vehicle use and on-road fuel economy data for base year data and forecasting model calibration.

Assembly Bill 118 (Núñez, 2007) created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) to develop and deploy renewable and alternative fuels and clean vehicle technologies in the marketplace, with the goal of transforming California's fuel and vehicle types to assist in attaining the state's climate change policies. The success of the American Recovery and Reinvestment Act of 2009 (ARRA) "Cash for Clunkers" programs is reflected in greater numbers of more fuel efficient vehicles as well as alternative vehicles on California roads. Assembly Bill 1493 (Pavely, 2002) requires a 30% reduction in GHG emissions by 2016. Senate Bill 375 (Steinberg, 2008) requires the establishment of GHG targets and development of sustainable community strategies. These regulatory and market developments have transformed California's large and complex petroleum-based transportation market and present both an opportunity and a need for data that better reflects these changes. More accurate reading of on-road fuel economy, specific to California vehicles and road conditions, is also important to more accurately evaluate the impacts of multiple California rules, regulations and standards. It is also important in meeting the requirements of SB 375, to improve accuracy in measuring and forecasting progress towards the AB32 (Núñez, 2006) greenhouse gas emission reduction and petroleum reduction goals, and to improve evaluation of different AB118 funded projects. Better understanding of California drivers' fueling behavior and driving patterns is important to the development of alternative and renewable fuels and fuel infrastructure.

The California Department of Transportation, hereafter referred to as the Department, conducts travel surveys every ten (10) years to obtain detailed information about the household socioeconomic characteristics and travel behavior of households statewide. The purpose of the 2010 California Household Travel Survey (2010 CHTS) is to update the statewide database of household travel behavior that is used to estimate, model and forecast travel throughout the State. The 2010 CHTS data is essential to the development and calibration of regional travel demand models for transportation planning and to assist in the forecasting of greenhouse gas (GHG) and criteria pollutant emissions.

To implement the survey, the Department engaged in a competitive procurement process to acquire consultant services. As a result of this procurement, NuStats, LLC (NuStats) was selected to conduct the 2010 CHTS, and entered into Agreement Number 72A0071 between

the Department of Transportation and NuStats, on June 4, 2010 (hereinafter referred to as "Agreement 72A0071").

The 2000 CHTS relied on travel diaries, did not utilize OBD data loggers, and used GPS only to verify the accuracy of, and modify, travel diary data. But the 2010 CHTS contract (Agreement 72A0071) includes funding for wearable GPS, in-vehicle GPS only, and combined in-vehicle GPS and OBD instrumentation. The 2010 CHTS Agreement 72A0071 defines the base core survey. The base core survey intends to collect completed travel surveys for up to 60,000 California households including GPS-OBD vehicle instrumentation for up to 3 vehicles per household for up to 1200 households. This Agreement will increase the number of completed GPS-OBD vehicle instrumented household surveys by 500 to increase diversity of vehicles in the on-road fuel economy database and the representation of alternative vehicle fuels and technologies. The sum of core survey households with GPS-OBD instrumentation plus the Energy Commission funded GPS-OBD surveys is referred to as the GPS-OBD survey or GPS-OBD subsample.

A number of local and regional agencies have joined with Caltrans in these efforts and added funds for additional surveys. These collaborations, including this Agreement, will save public funds, improve efficiency in the use of pooled funds, reduce redundancy and coordinate efforts of agencies responsible for transportation energy assessments, improve the quality and increase the quantity of data essential to more accurately measure California-specific on-road fuel economy, and make more accurate and consistent information available to state and local transportation planning agencies. A Steering Committee (hereinafter referred to as the "Steering Committee") representing CEC, Metropolitan Transportation agencies, Rural Transportation Planning Agencies, the California Association of Council of Governments (CALCOG), ARB and other public agencies was organized to create the Scope of Work and Request for Proposal and to retain a consultant to perform the technical aspects and implementation of the 2010 CHTS program.

1. Objective

The objective of this agreement is to improve and increase data that is essential to computing on-road fuel economy, in-vehicle minutes, vehicle miles traveled (VMT) and emissions for conventional, alternative and renewable fueled vehicles. The goal is to improve accuracy of VMT and on-road fuel economy data for California household vehicles.

2. Purpose of This Agreement

The purpose of this Agreement is to provide funds to the Department to increase the number of completed surveys of 2010 CHTS households with combined GPS and OBD data logger vehicle instrumentation by 500 and obtain data for 2010 CHTS households with both GPS and OBD vehicle instrumentation.

3. List of Key Participants and project representatives during the term of this Agreement

California Energy Commission	California Department of Transportation	NuStats LLC
Project Manager: Aniss Bahreinian	Project Manager Peter Spaulding	Project Manager: Jesse Casas
Address Fossil Fuels Office Fuels and Transportation Division 1516 Ninth St. Sacramento, CA 95814-5504	Address Transportation Systems Information Office of Strategic Planning & Performance Measurement 1120 N St, MS 38 Sacramento, CA 95814	Address 206 Wild Basin Rd, Building A, Suite 300 Austin Texas 78746
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II. Scope of Work and Deliverables

This section describes the scope of work, deliverables and due dates.

The work to be performed under this Agreement shall be as described and conducted by Department and or NuStats on behalf of the Department under Agreement 72A0071, as appropriate

Task 1 Contract Management

The goal of this task is to discuss program status and review program management. Participants will include the Energy Commission Contract Manager (CCM), the Department Project representative, NuStat's project Manager, and other individuals selected by the Energy Commission and/or other project participants.

1.1 Meetings

The meetings will be held quarterly, at a minimum, or based on expressed need.

The Department shall:

- Collaborate with the Energy Commission to determine the location, date, and time of each meeting and to establish an agenda. These meetings may take place at the Energy Commission or another location
- Provide a list of participants to the CCM in advance of the meeting
- Attend and participate in the meeting

1.2 Work Plan

The Department shall ensure that NuStats updates the portion of the 2010 CHTS work plan that includes description of the 2010 CHTS travel survey that is specific to the GPS/OBD instrumented vehicles and households. The work plan shall include an updated 2010 CHTS schedule for the travel survey that is specific to the GPS/OBD instrumented vehicles and households.

1.3 Quarterly Progress Report

The Department shall ensure that NuStats provides a one-page report on the progress of the 2010 CHTS travel survey.

Task 1 Deliverables

1.1 Schedule and Agenda of quarterly meetings

1.2 Work Plan

1.3 Quarterly Progress Report

Task 2 – GPS/OBD Survey Design and Pre-test

The goal of this task is to recommend the GPS and OBD data logger instruments, sampling plan, and design and pretest the GPS/OBD survey instruments to increase the number of renewable and alternative fueled vehicles. Included in the 2010 CHTS GPS/OBD survey design is the development of the survey sample frame, sample plan, interview plan/materials, and GPS/OBD survey materials for survey pre-test.

The Department shall ensure that NuStats

- uses GPS/OBD survey design that is consistent with what is approved by the Steering Committee;
- distributes surveys, in the sampling plan, as determined by the Steering Committee;
- selects sample, for the GPS/OBD main survey effort, from the sampling frame provided by the Energy Commission that contains households with hybrid, flex fuel, and alternative fuel;
- uses recruitment and deployment methodologies that are identical to those used for households receiving both GPS and OBD data loggers in the base core survey, as described in Agreement 72A0071;
- implements recommendations for GPS and OBD equipment, as approved by the GPS/OBD Technical Advisory Committee (TAC) of the Steering Committee and described below:
 - Qstarz BT-Q1000x or Qstarz BT-1000xt.
 - CarChip Fleet Pro with modified firmware (note: modifications defined, tested, and implemented to support CEC specific survey questions for all alternative fuel vehicles).
 - Work with CarChip to define modifications to best collect the following data items (it should be noted that some vehicles may not support all data elements listed):
 - a. 1-second interval:
 - Speed
 - b. 5-second intervals:
 - Mass Air Flow rate (S.I. kg/s 3 decimal points)
 - Engine Load (%)
 - Engine Speed (U.S. RPM)
 - Throttle Position (%)
 - c. Trip level:
 - Start Time, End Time, Duration,
 - Maximum speed
 - number of hard and extreme accelerations and decelerations

- time in top speed band (possible - not confirmed)
- d. Additional and/or conditional data:
 - VIN captured once, when the CarChip is plugged in (in all vehicles 2005 and newer)
 - Emissions Readiness-captured once per trip
 - Check Engine Light- checked once per minute, but only changes are logged.
 - Fuel Type will be queried at least once per trip, if supported it will be logged
- Test the CarChip with modified firmware, with all firmware changes implemented in the CarChip prior to the pretest so that all functionality and desired data elements (at both the 5-second, 1 second, and trip level frequencies) are confirmed as valid, usable, and useful.
- conducts pretest to evaluate GPS/OBD deployment methods, participation rates, and data quality in the GPS/OBD sample (goal for pretest: 60 complete GPS/OBD households);
- produces and/or provides participant materials as needed for successful deployment including development of the OBD household vehicle roster to capture additional data items otherwise unavailable (including odometer reading at time of CarChip installation and license plate number for each instrumented vehicle);
- sets up and maintains GPS /OBD study deployment website;
- documents desired GPS device configuration settings and logging frequency to collect the following GPS data items:
 - a. 1-second interval:
 - Date
 - time
 - latitude
 - longitude
 - speed
 - heading
 - Horizontal Dilution of Precision (HDOP)
 - number of satellites
 - (1 sec logging interval with 0 speed screens not logged)
- provides a basic QStarz BT-Q1000x or xt configuration and download utility which forces the proper configuration, file naming convention, and output data formats;
- develops deployment team instructions for preparation of GPS and OBD devices and materials, as well as for check in of returned devices and materials;
- trains GPS/OBD deployment staff and provide support through pretest;
- evaluates and documents the lessons learned from the Survey Pre-Test and prepares a summary report to describe any refinements and revisions to survey methods, material and procedures recommended for the GPS/OBD subsample, the non-respondent follow-up contact, and the remedies to increase response rate and/or avoid/minimize potential adverse effects of non response;

Task 2 Deliverables:

2.1 GPS/OBD Survey Design

2.2 Pre-Test GPS/OBD household survey data files and summary report.

Task 3 - Refine GPS/OBD Survey Methods, Instruments, Materials and Procedures for Survey

The goal of this task is to refine and finalize GPS/OBD survey design based on pre-test results.

- The Department shall ensure that NuStats reviews the results of the Pre-Test with Energy Commission's Project Manager and the Steering Committee and recommend any final revisions to the survey methods, instruments, materials and procedures for the survey.

Task 3 Deliverable:

Final GPS/OBD survey methods, instruments, materials and procedures

Task 4 - Conduct GPS/OBD Survey, Evaluate and Geocode Survey Results

The Department shall ensure that NuStats:

- selects, trains and manages enough deployment team members located across California to complete all GPS/OBD vehicle instrumented travel surveys;
- deploys GPS and OBD devices for one week of data collection for GPS/OBD households selected from across the state (proportional to 2010 CHTS distribution by MPO), using methods and systems developed in pretest and refined for main survey;
- provides sufficient in-vehicle GPS and OBD devices to deploy up to 3 household vehicles for 7 consecutive days;
- interviews the households selected using consistent and approved survey methods, material and procedures;
- conducts enough surveys, and non-respondent follow-up contacts to reach the goal of CEC funded 500 completed GPS/OBD household travel surveys, in addition to the number of GPS/OBD surveys completed for the base core survey under Agreement 72A0071;
- evaluates/monitors the on-going survey results and maintains quality control;
- achieves the goals for collecting complete household survey data for the GPS/OBD households, as defined in the 2010 CHTS Survey and directed by the CHTS Steering Committee;
- geocodes the survey data to standardized geographic codes for database development and analysis;
- creates interim data file to store data collected by all participating GPS/OBD households and vehicles and match parameters collected on the OBDII device by time to the GPS data points to provide location information.
- provides the CCM with two working passwords to access the 2010 CHTS Survey website and the survey results.

Task 4 Deliverable:

Interim GPS/OBD Survey Data Files

Two working passwords to the 2010 CHTS survey website

Task 5- Validate Survey Results, Analyze Statistical Accuracy of the GPS/OBD Survey Data

The goal of this task is to ensure accuracy of data processed from the raw data logged by GPS and OBD data loggers for the households participating in the GPS/OBD survey.

Description:

The Department shall ensure that NuStats:

- processes all GPS and OBD data.
- expand standard GPS data to accommodate all integrated OBD data
- parameters collected on the OBDII device will be matched by time to the GPS data points.
 - Standard GPS Tables include:
 - Household Summary
 - Vehicle Summary
 - GPS Trips Summary
 - GPS Links (GPS points matched to street network)
 - GPS Points
 - GPS to Diary Trip Matching Results
 - Expanded GPS tables with OBD data, at a minimum includes:
 - GPS Vehicles expanded to include VIN, if available.
 - GPS Trips expanded to include OBD trip level information as well as additional/conditional information (e.g., emissions readiness and fuel type, if available) or a separate OBD Trips table with OBD trip level information (if GPS and OBD trips do not align).
 - GPS Points expanded to include 1-second and 5-second OBD data as well as Check Engine Light update (if available and applicable).
- checks, edits, geocodes and validates the household, person, vehicle, trip/activity, location and GPS/OBD survey data collected;
- combine responses from CEC specific survey questions (from Task 2) for GPS/OBD household surveys with the responses to base core GPS/OBD surveys, develop weighting factors, and expand the survey data.
- Prepares a Task 5 Report, that shall include, at a minimum, the following:
 - detailed monthly statistical summaries of GPS/OBD household participation rates, renewable/alternative fueled vehicle participation rate, and other similar indicators of accuracy and consistency;
 - summary of procedural statistics for each GPS/OBD sample, including number of contacts, participation rates, completed responses in each cell of the sampling stratification, completed response rates by question, cross-tabulations, and other such descriptors as NuStats and the Steering Committee jointly agree upon.

Task 5 Deliverables:

5.1 Task 5 Report

5.2 Expanded GPS/OBD Tables

Task 6 - Prepare Final Survey Report and Statewide Data Files

The goal of this task is to create a complete database for the GPS/OBD subsample of all households participating in the 2010 CHTS travel survey.

The Department shall ensure that NuStats:

- prepares a Final Report on the GPS/OBD survey of instrumented vehicles and the participating households; and
- prepares a final data file.

Final Report Content shall include but not be limited to:

- Methods used in sampling the participating households, if different from what is outlined in the 2010 CHTS travel survey report;
- List of data items collected;
- Statistics and summaries of GPS/OBD household survey results; and
- Limitations of the GPS/OBD survey.

Final GPS/OBD Data Files shall include household, activity, travel, vehicle, location and fuel data for 2010 CHTS households participating in the GPS/OBD travel survey. Standard GPS dataset shall be expanded to accommodate all integrated OBD data. Database shall be submitted in electronic format, and shall include a final data dictionary that clearly identifies, defines and describes the data.

Task 6 Deliverables

6.1 Final GPS/OBD data file

6.2 Final Report

DELIVERABLES AND DUE DATES

TASK	DELIVERABLES	DUE DATE
1	1.1 Schedule and Agenda of Quarterly Meetings	Quarterly
	1.2 Work Plan	Quarterly
	1.3 Quarterly Progress Report	Quarterly
2	2.1 GPS/OBD Survey Design 2.2 Pre-test GPS/OBD household survey data files and summary report	September 30, 2011
3	Final GPS/OBD Survey Methods, Instruments, Materials and Procedures	December 30, 2011
4	Interim GPS/OBD Survey Data Files Two working passwords	June 30, 2012
5	5.1 Task 5 Report 5.2 Expanded GPS/OBD Tables	December 30, 2012
6	6.1 Final GPS/OBD data file 6.2 Final Report	March 1, 2013